

# ecodan<sup>®</sup>

Advanced Heating Technology

QUHZ Ecodan CO<sub>2</sub> Advanced Hot Water Heat Pump



# Ecodan CO<sub>2</sub> Advanced Hot Water Heat Pumps Super-Efficient Next Generation Technology

Mitsubishi Electric has utilised their expertise and industry-leading technology to develop Ecodan CO<sub>2</sub> Hot Water Heat Pumps. The system has been specifically designed to provide all the super energy efficient hot water heating requirements for a household of up to 4 people, or alternatively can also be used to provide both space heating for a small one bedroom apartment as well as covering its hot water requirements at the same time.

**On average, domestic hot water accounts for over 36%\*1 of the overall energy bill in New Zealand homes.**

Domestic hot water heating is therefore an obvious area to target in reducing energy bills. This is especially pertinent during the winter months, where a combination of taking longer, hotter showers and the increased need for a warm and dry home, typically drives up power bills. An Ecodan CO<sub>2</sub> Hot Water Heat Pump System can help reduce hot water bills when compared to gas and direct electric systems.

## What is an Ecodan CO<sub>2</sub> Hot Water Heat Pump?

The Ecodan CO<sub>2</sub> Heat Pump is an advanced heat pump system that can either combine the hot water heating supply and room heating for a small apartment, or provide the complete hot water heating requirements for a typical 4 person household.

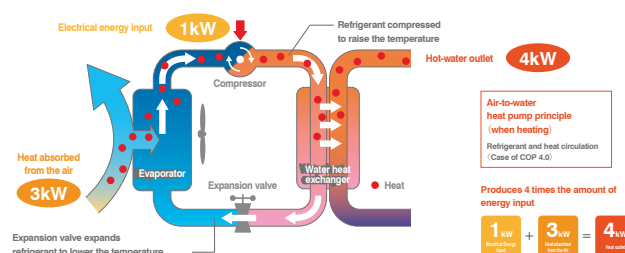
## Why CO<sub>2</sub>?

CO<sub>2</sub> is used as the refrigerant in this product because it is a naturally occurring gas. Recent technical advances in heat pump technology have allowed us to harness this gas which would have no adverse effect on the environment should it ever leak into the atmosphere, unlike other refrigerants which have the potential to add to global warming in the unlikely event that they ever leak.

CO<sub>2</sub> (R744) is a safe, naturally occurring (0.04%) of atmosphere, non-flammable and stable refrigerant fluid solution. It is non-toxic (at reasonable concentrations) and with a Global Warming Potential (GWP) number of 1, it is also the base refrigerant that all other refrigerants GWP numbers are based on.

## What is a Hot Water Heat Pump

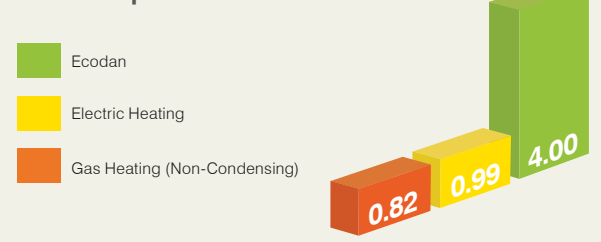
Heat pumps use electrical energy and take low grade heat energy from the outdoor air to heat refrigerant which in turn heats water for domestic use and space heating.



The efficiency of a heat pump is known as the Coefficient of Performance or COP. This is a ratio of the heat delivered to power consumed. For every 1kW of electrical input energy, Ecodan absorbs renewable heat energy from the outdoor air to provide the home with over 4kW\*2 of heat output.

Compared to typical gas and direct electric heating systems that can have higher running costs with COPs as low as 0.82\*3, Ecodan provides an energy efficient alternative.

## COP Comparison Chart



\*1 Based on data sourced from NZGBC.

\*2 The overall system efficiency and energy savings will depend on the comparison with your current heating system, satisfactory system design and installation, and operational settings i.e. how you use the heating system.

\*3 Based on manufacturer information for gas instant hot water heater (non-condensing).

## The Ecodan QUHZ Advantage

The Ecodan QUHZ has been specifically designed to operate with exceptionally high efficiency in the production of hot water. The system operates with a market leading low noise output and built in energy monitoring is standard.

Rated at 4kW the Ecodan QUHZ is ideal to satisfy the hot water requirements for new build homes and can also be retro-fitted in existing homes. Alternatively, it can also provide both domestic hot water and room heating for small one bedroom apartments.

## Key Features

- High efficiency domestic hot water production  
COP=3.7\*
- Class leading low noise operation at 43dBA outdoor unit
- Energy monitoring as standard
- No stored water draw, no risk of legionella
- High hot water capacity for larger dwellings up to 70°C
- Pre-plumbed and wired for faster installation
- No refrigerant pipework into the house, water connections only

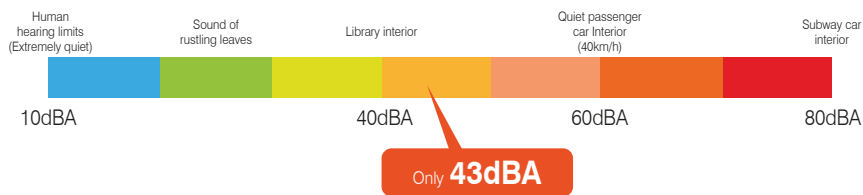
\* Under heating conditions; outdoor temperature 7°C, water outlet temperature 65°C, flow rate 1.4L/min.

## Industry Leading Low Noise Operation

The Ecodan QUHZ operates with an industry leading low noise output.

Specific outdoor unit design features enable quiet operation to be maintained in all modes of operation and all ambient conditions.

Low noise output also allows improved flexibility in the installation location of the heat pump. The Ecodan QUHZ will help residential areas that are particularly sensitive to outdoor noise to benefit from renewable heating technology.



## Ideal for High Density Housing

With space often being a premium on new build development sites, Ecodan QUHZ will operate discreetly where dwellings are in close proximity to each other. The QUHZ Outdoor unit provides very quiet operation as low as 43dBA (SPL)\*\* & 53dBA (PWL).



\*\* Measured at 1m from the front of the outdoor unit.





# Mitsubishi Electric Unique Heat Exchange Technology

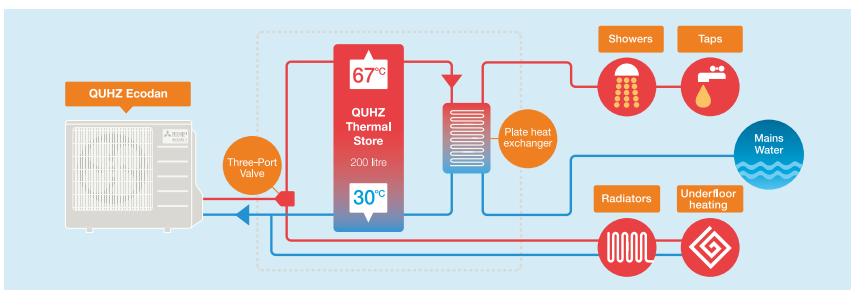
The Ecodan QUHZ is Mitsubishi Electric's latest hot water heat pump system and is the ideal solution for both new build and existing homes. The Ecodan QUHZ has been specifically designed to operate with exceptionally high efficiency in the production of hot water.

## Greater Flexibility and Enhanced Efficiency

Using a thermal store allows greater flexibility and enhanced efficiency when applying Ecodan QUHZ to different types of homes. Varying the setpoint of the thermal store, and how much of the store is heated, ensures the correct amount of hot water is produced for the home. See the example on the right.

### The Thermal Store Explained

- The Ecodan QUHZ provides hot water to the home using a dedicated pre-plumbed 200 litre thermal store.
- The thermal store is specifically designed to enable efficient production of hot water for a household of up to 4 people and uses advanced control logic to provide optimum performance at all times.
- The Ecodan QUHZ Outdoor unit is connected to the thermal store by a sealed primary circuit.
- Mains cold water is heated instantaneously as it passes through a plate heat exchanger and the hot water produced is sent directly to the outlets ready to use.
- As domestic hot water is not stored in the system there is no risk of legionella associated with traditional hot water tanks.



## Greater Flexibility and Enhanced Efficiency Example

Four Person Household



200 litre QUHZ Thermal Store

65°C

Equivalent of

250 litre Hot Water Cylinder

55°C

One Bedroom Apartment



100 litre QUHZ Thermal Store

55°C

Equivalent of

120 litre Hot Water Cylinder

50°C

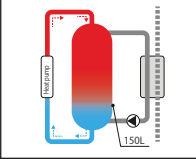
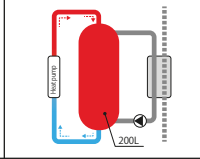
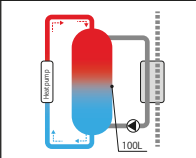
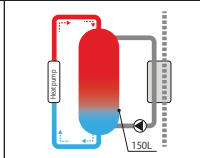
## Optimum Water Temperature is Maintained

This system uses a heat store rather than potable stored water to enable good stratification of the heat store which maintains the systems efficiency and allows fresh cold water to be instantly heated up through the integrated heat exchanger which will eliminate any potential issues with legionella associated with traditional stored water systems in the tank.

## Mode Selection

The user can select a mode to suit usage and occupancy. In Normal Mode the system stores enough heat to deliver around 250L of hot water, in E.Save Mode the system will store enough heat to deliver around 120L of hot water.

When the Domestic Hot Water (DHW) storage volume shows a decrease of 50L from the DHW max. amount, DHW Mode operates and the flow from the primary heating circuit is diverted to heat the water in the thermal store tank.

DHW Storage Volume	E. Save	Normal
DHW max. amount		
DHW restart amount		

## Unique Twisted & Spiral Gas Cooler to Maximise Heat Transfer

The twisted & spiral gas cooler (heat exchanger) is Mitsubishi Electric's unique technology. Three connected refrigerant pipes are wound around the twisted water pipe which maximises the heat transfer area.



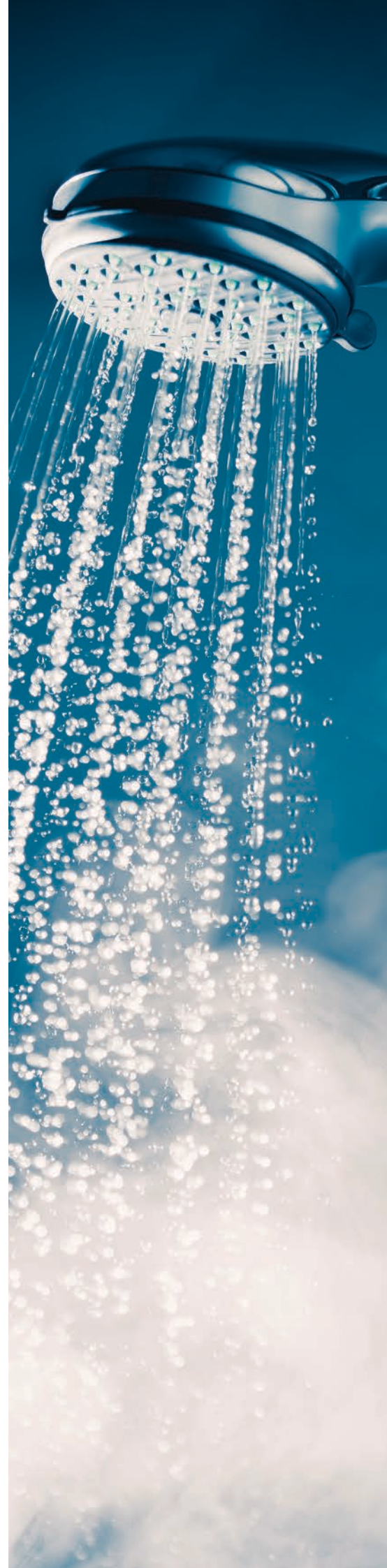
Twisted water pipe with the refrigerant pipe spiralled around it



Cut section detail

## Enhanced Water Flow Whilst Maintaining Optimum Water Pressure

The continuous spiral grooves in the twisted pipe accelerates the turbulence effect of water and also helps to reduce pressure loss within the heat exchanger.



# Ecodan QUHZ Outdoor Unit



## ECODAN QUHZ

Rated at 4kW the Ecodan QUHZ is ideal to satisfy the hot water requirements for a new build home and can also be retro-fitted in existing homes. Alternatively, it can also provide both hot water heating and room heating for one bedroom apartments.

### Key Features

- High efficiency hot water heating performance
- Class leading, low noise operation at 43dBA
- Quietest outdoor unit in New Zealand
- Small outdoor unit, reduced footprint
- Lightweight outdoor unit



QUHZ-W40VA

OUTDOOR UNIT			QUHZ-W40VA
NOMINAL WATER FLOW RATE (HEATING MODE)		L/min	5.7
HEATING (A7/W35) <sup>*1</sup>	Capacity	kW	4
	COP		4.2
	Power input	kW	0.96
HEATING (A2/W35) <sup>*2</sup>	Capacity	kW	4
	COP		3.1
	Power input	kW	1.3
NOMINAL WATER FLOW RATE (DHW MODE)		L/min	1.4
DHW (A7/W65) <sup>*3</sup>	Capacity	kW	5
	COP		3.7
	Power Input	kW	1.35
POWER SUPPLY (PHASE, CYCLE, VOLTAGE)	Max. current	A	12.0
BREAKER SIZE			-
EXTERNAL FINISH			Munsell 2.5Y 7/1
HEAT EXCHANGER	Air		Plate fin coil
	Water		Twisted & spiral Gas cooler
FAN	Fan (drive) x No.		Propeller fan x1
	Fan motor output	kW	0.050
	Air flow	m <sup>3</sup> /min	34 (MAX)
NOISE LEVEL (SPL)	Heating	dBA	43
NOISE LEVEL (PWL)	Heating	dBA	53
DIMENSIONS (mm)	Width	mm	809 + (70) <sup>*4</sup>
	Depth	mm	300 + (20) <sup>*5</sup>
	Height	mm	715
WEIGHT		kg	57
REFRIGERANT			R744
	Quantity	kg	1.15
WATER PIPE SIZE O.D		mm	22
PIPE CONNECTION			G1/2
PIPEWORK BETWEEN THE INDOOR & OUTDOOR	Max. Height difference	m	5
	Max. Piping length	m	15
GUARANTEED OPERATING RANGE (OUTDOOR)	Heating	°C	-15 ~ +35
OUTLET WATER TEMP. (MAX. IN HEATING)	Heating	°C	+60
OUTLET WATER TEMP. (MAX. IN HOT WATER)	DHW	°C	+72
NOMINAL RETURN WATER TEMPERATURE RANGE	Heating	°C	+9 ~ +55
WATER FLOW RATE RANGE (HEATING)		L/min	3.0 ~ 8.0

\*1 Under nominal operating conditions: Outdoor temp 7°CDB / 6°CWB, outlet water temp 35°C, inlet water temp 25°C

\*2 Under nominal operating conditions: Outdoor temp 2°CDB / 1°CWB, outlet water temp 35°C, inlet water temp 25°C

\*3 Under nominal operating conditions: Outdoor temp 7°CDB / 6°CWB, outlet water temp 65°C, inlet water temp 15°C

\*4 Piping cover

\*5 Wire grille

# Ecodan QUHZ Cylinder

## THERMAL STORE

The Ecodan QUHZ provides hot water to the home using a dedicated pre-plumbed 200 litre thermal store.

The thermal store is specifically designed to enable efficient production of hot water and space heating and uses advanced control logic to provide optimum performance at all times.

## Key Features

- 70°C domestic hot water
- Energy monitoring as standard
- Pre-plumbed and wired for faster installation
- No stored water, no risk of legionella
- High hot water capacity for large dwellings



EHPT20Q-VM2EA

INDOOR UNIT			EHPT20Q-VM2EA	
NOMINAL THERMAL STORE TANK VOLUME			L	200
OVERALL UNIT DIMENSIONS			mm	1600 x 595 x 680 (Height x Width x Depth)
WEIGHT (EMPTY)			kg	77
WEIGHT (FULL)			kg	283
PRIMARY EXPANSION VESSEL (ACCESSORY ITEM)	Nominal volume		L	18
	Charge pressure		bar/kPa	1.0 (100)
SAFETY DEVICE	Water circuit (Thermal store tank)	Control thermistor (THW1)	°C	42 - 72
		Control thermistor (THW3)	°C	80
		Pressure relief valve (2 No. devices)	bar/kPa	3.0 (300)
		Flow sensor min flow	L/min	Min flow 1.3
	Booster heater	Manual reset thermostat	°C	90
		Thermal Cut-out (for dry run prevention)	°C	121
CONNECTIONS	Primary circuit		mm	Ø 22.0
	Secondary (potable) circuit		mm	Ø 22.0
TARGET TEMPERATURE RANGE	Space heating	Flow temperature*1	°C	25 - 60
		Room temperature	°C	10 - 30
	DHW supply temperature range		°C	40 - 70
GUARANTEED OPERATING RANGE	Ambient*2		°C	0 - 35 (80%RH)
	Outdoor temperature		°C	-15 ~ +35
ELECTRICAL DATA	Control board	Power supply (Phase, voltage, frequency)		single / 230V / 50 Hz
		Current	A	12.8
		Breaker (Local supply)	A	20
	Booster heater	Power supply (Phase, voltage, frequency)		single / 230V / 50 Hz
		Capacity	kW	2
		Current	A	8.7
Breaker	A	16		
SOUND POWER LEVEL			dBA	40
MAXIMUM SECONDARY (POTABLE) WATER SUPPLY PRESSURE			bar/kPa	10 (1000)
MAXIMUM PRIMARY WORKING PRESSURE			bar/kPa	2.5 (250)
MINIMUM PRIMARY WORKING PRESSURE			bar/kPa	1.0 (100)

\*1 Depending on the ambient conditions, it may not reach the set temperature, please refer to the databook.

\*2 The cylinder's environment MUST be frost-free.



## Manufactured in Japan

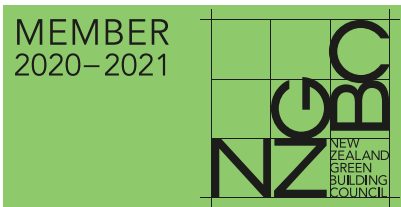
The Mitsubishi Electric manufacturing facility in Gunma, Japan produces the QUHZ Hot Water Heat Pump and Cylinder System for the global market.



## Full 5 Year Warranty

Every Ecodan Air Source Heat Pump comes with a full 5 year warranty as standard, subject to the following conditions:

- The Ecodan purchase and installation is registered with BDT.
- The Ecodan must be installed and commissioned by a trained BDT Installer.



## Member of the NZGBC

The New Zealand Green Building Council (NZGBC) is a non-profit membership organisation that promotes better buildings. Thousands of buildings are being constructed, providing healthier and happier workplaces and homes for thousands of Kiwis.



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